020

CAR POOL PROGRAM MEETING
University of Minnesota

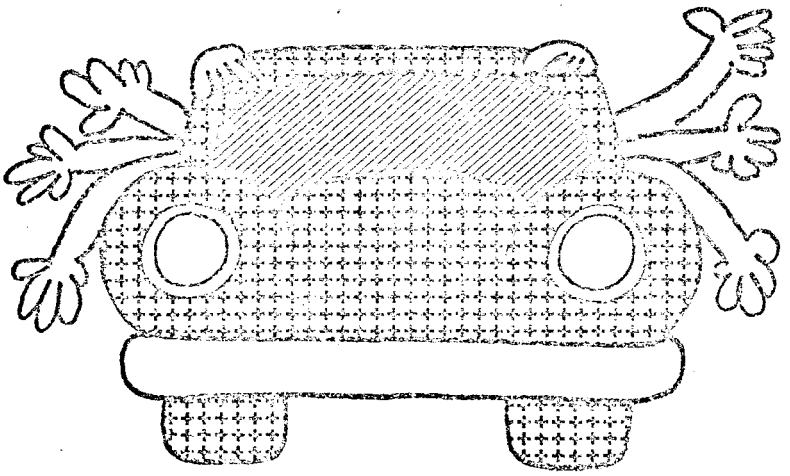
December 12, 1973
503 Morrill Hall

Subject: Third Quarterly Progress Report

Agenda:
1. Fall Quarter Results
2. Fall Quarter Costs
3. Recommended Program Changes
4. Discussion

PERSONALIZED COMPUTER CAR POOL SYSTEM
University of Minnesota

Third Quarterly Progress Report
December 1973



Submitted by:

Office Of Physical Planning
Hybrid Computer Laboratory

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Introduction

The first demonstration of the Computer Car Pool Program was run during the week of September 17th, 1973. The results of the program are summarized in this third quarterly progress report and are based upon two information sources; the statistics provided by the Hybrid Computer Laboratory, and the statistics tabulated from the questionnaire which was sent out to the Fall Quarter applicants.

The program goal for the Fall Quarter was to test the computer program which eliminated the manual matching process as utilized during the 1972-73 academic year. Phase I of the HCL program matched people through a cost weighted algorithm within TAZ's, the program performance of which is documented in the Interim Report previously submitted.

The result of the Phase I matching process follows.

Participant Characteristics

Applications received for the Fall Quarter represented an increase of 119% over Fall Quarter of the 1972-73 academic year. Of the 2082 applications received, 318 were late and could not be processed leaving 1766 applications to be keypunched and run through the ADMATCH program which helps to locate the applicant within the Metropolitan Area. The ADMATCH program eliminated 201 applicants because they could not be located, due to incomplete addresses not in the program, or inaccurate input. The remaining 1565 applicants were located within the TAZ's (799) of the 7-County Metropolitan Area and matched with someone else located within the same TAZ considering time, origin, and destination. The 1565 people were dispersed among some 799 TAZ's encompassing a 7-County Metropolitan Area of 3,000 square miles having a population of 2 million. Obviously, if the number of applicants was increased to 15,650, instead of one tenth that amount, the chances of receiving a quality match would increase greatly. However, with respect to the characteristics of the University population (documented in the Interim Report) the 2082 potential carpoolers represented 4% of the total 53,000 University population.

Phase I

Of the 1565 people processed 53% received matches and 47% were not matched because they were the only persons located within a TAZ. This was Phase I of the refined matching process.

Phase II

Phase II implemented for the Winter Quarter, will provide an applicant with a number of matches found within each TAZ and then the adjacent TAZ. If names are still not found the applicant's zip code will be searched for the minimum amount of matches. The zip code matching is the least refined process and would not consider travel times as does the TAZ matching process. With these three procedures the percent of people provided with matches should be increased considerably. The percent of those not matched should consequently be decreased significantly.

Fall Quarter Results

Questionnaires were sent to all applicants during the first week of November 1973. A 9% return was received and reflected earlier figures. Of the questionnaires returned 58% indicated they received matches and 42% indicated no matches were received. This compares with the computer statistics which showed that 53% received matches and 49% did not.

The following questionnaire evaluation is based upon the 59% receiving matches. Of these applicants 45% formed a car pool through the system while 55% were unable to form a car pool for numerous reasons. This 45% is a 15% increase over the results of the 1972-73 program however, the percentage of last year's applicants receiving matches is unknown.

Computer Program Changes

In conjunction with the Second Quarterly Progress Report comments received from the Federal Highway Administration and the Minnesota Highway Department, the program will attempt to provide each applicant with a minimum of 6 names during the Winter Quarter demonstration program. To do this the cost evaluations given to arrival and departure times will be relaxed considerably and therefore the matching program will be largely based upon the travel times between applicants (shared drivers and riders). The schedule will still be printed and the applicant can contact the people he or she considers most feasible.

Questionnaire Evaluation

The following summarizes the questionnaire statistics (appendix A) in rounded percentages and is based upon the answers provided by people receiving matches.

1. Undergraduate students represented 54% of those receiving matches, while staff represented 29%. Graduates and faculty each had 8%.

   44% of the participants were female although 18% did not respond. Also, of those responding to the questionnaire a large percentage was age 25 years or over.

2. 42% lived within 6-10 miles of the University. Also, it is interesting to note that of those people forming a carpool 32% lived 6-10 miles away and 44% lived 11-20 miles away. The geographical locations having greater participant concentration were, northeast, south, southwest and west.

3. Number of people forming a pool were 45% as opposed to 55% who couldn't form a pool.

4. A general overview of participation overlap from last year indicates that an average 28% had applied last year during either the Fall, Winter or Spring Quarters. Of that 28% some 11% had formed a pool. However, 23% of the people did not respond to the question.

5. People satisfied with the system represented 25% while 38% were not satisfied but would reapply. Obviously the people forming a car pool were more satisfied (50%) than those not able to form a pool.

6. Fifty four percent of the people received one arrival match and 22% received 2 arrival matches. On the other hand, 47% received one departure match and 17% received two. 83% wanted to receive more matches.

7. It is interesting to compare the figures between those people car pooling and those not car pooling. Those people successfully matched had 50% of the matches within 5 blocks of their home and 21% were within 10 blocks while those unable to effect a car pool indicated 31% were 10 blocks away and 40% were 15 blocks to 2 miles distant.

Questions 8 through 18 only apply to those people in a car pool.

8. Forty one percent of the people had driven alone previous to car pooling and 24% had ridden a bus 3% of which indicated they had ridden the University Express Bus. To what extent the single drivers were matched with bus passengers is unknown and what percent of the single drivers began to share driving is difficult to determine.

9. 76% indicated they were satisfied with the system.

10. 56% indicated there were 2 people in their car pool for arrival and 50% had 2 people for departure. 21% had 3 people for arrival and 30% had 3 for departure. Carpools of 4 people was 12% for arrival and 3% for departure.

11. Of the carpoolers, 41% drove regularly, 32% shared driving and 27% were riders. The unknown is what percentage of the shared drivers were originally people who drove alone.

12. While a priority car pool lot is provided for 3 people or more only 9% of the carpoolers indicated they parked there. This could be because (according to question 10) 56% of these people had only 2 people in their pool. 59% parked in other University lots.

    In conjunction with this question a verbal survey was conducted December 3 of 81 cars coming into the car pool lot. The average occupancy per car was 4 people. Of the possible 324 people 5% had formed a car pool through the system. This helps to portray the degree to which students have formed their own car pools for economic or convenience reasons.

13. The greater percentage of car pool costs were handled by the riders paying a set fee.

14. 41% of the pools alternated drivers while 59% did not.

15. 79% rode with the same people both morning and evening.

16. Travel time was increased 10 minutes for 18% of the people and 12% increased travel time by 5 minutes while 30% were not affected. 6% indicated travel time was decreased by 10 minutes.

17. 77% said they would use a central printout. This is currently provided in the Transit Services office however, the availability of this list has not been widely publicized. It's format will be simplified for the Winter Quarter process requiring less explanation on the part of the Transit Services office.

18. Comments on the part of carpoolers are documented in the appendix. The majority of people made comments similar to those received during the 1972-73 academic. However, the predominating theme seemed to be the need for more names in a larger geographical area.

The comments of the carpoolers and the contractual entities have been considered and more matches will be provided for each applicant during the Winter Quarter demonstration.

In addition, in order to more throughly evaluate the program results, the questionnaire is being examined by the University Measurement Services Center and the Director of the University Opinion Poll.

Conclusions

Phase I of the program provided 834 people with matches. A 9% return revealed that about 45% (375) applicants became part of a car pool as a result of the service, 32% of which were shared drivers. The average size of a car pool was 2.6 persons. The average round trip was 21 miles. If the 32% of 375 carpoolers represents 120 shared drivers one could assume that 120 less cars travel to the University each day. When considering energy conservation, the fuel saved each day (based upon 14 miles per gallon)would total 180 gallons. Per week this would be 2,000 gallons and per academic quarter (10 weeks) 20,000 gallons. The economics of carpooling could be calculated accordingly.

With the addition of Phase II which will provide more matches per applicant, it is hoped that the number of people matched will increase from 53% to 80 or 90%. Whether or not the percentage of those people forming carpools is increased from 45% to a higher number remains to be evaluated.

Fall Quarter Processing

The actual cost of processing the applications (exclusive of the computer operation) for the Fall Quarter demonstration program was $1,026.16 as itemized below.

1.	Data Processing Cards	$ 60.00
2.	Design Application Form (2 sides)	40.20
3.	Print Application Form	306.30
4.	Key punch Application Forms	347.22
5.	Separate and fold Computer Printouts	38.05
6.	Window well Envelopes (2,000)	26.80
7.	Stuff Printouts in Envelopes	70.31
8.	Postage and Mailing	137.28
		$1,026.16

These services were provided by three (3) departments within the University; Central Duplicating, Data Processing and Addressing and Mailing. The procedure was coordinated by the Transit Services Office.

In addition, the computer operation cost was $350 increasing the figure to $1,376.16.

Not included is the personnel time devoted to the research and operation of the project on the part of the Transit Services Office and the Physical Planning Office.

One-Time Costs

Promotion

A one-time cost for the development of a public relations program was $999. The 300 posters (including application pads) 5,000 informational handouts, and a public service announcement with slides were provided including recommended promotional procedures. The material has already proved helpful and will be used in many ways as the service continues.

Computer Program Development

The Hybrid Computer Laboratory is in agreement to complete the 12-month computer research and demonstration program for $7,765.

Together the one time costs total $8,764, which amortized over a period of years and multiple usage is nominal when related to possible results.

Summary

Once the computer program is completed the direct costs for processing each quarter should not exceed $1500-1600 depending upon the number of applications received.

The car pool processing cost incurred this past quarter was $1,026.16 in addition to which the computer operation cost of $350 is added to total $1,376.16 for the processing of 1766 applications, at 79¢ per applicant.

APPENDIX A

Dear University Car Pooler: 1 November 1973

Thank you for participating in our Personalized Computer Car Pool Service. In order to evaluate the results we would appreciate your assistance so that we may further improve the matches made available to you. Please complete the following questions and return via free Campus Mail by November 19th to: Physical Planning, 503 Morrill Hall, Minneapolis Campus.

1. What is your designation within the University? __ undergraduate __ graduate __ faculty __ staff __ adult special __ male __ female ___ age

2. How far do you live from the University? ___ blocks ___ miles N,NW,NE,E,S,SE,SW,W (circle)

3. Are you currently in a car pool formed through the Car Pool Service? ___ Yes ___ No

4. Did you apply to the Car Pool System last year? ___ Fall ___ Winter ___ Spring
   Did you form a Car Pool last year through the system? ___ Fall ___ Winter ___ Spring
   (Answer the above with yes or no.)

5. Do you intend to reapply next quarter?

   ___ I was satisfied this quarter and will reapply.
   ___ I was satisfied this quarter, but do not need to reapply.
   ___ I was satisfied this quarter and will stay in the same car pool.
   ___ I was not satisfied this quarter, but will reapply.
   ___ I was not satisfied this quarter and will not reapply.

6. How many matches were you provided with this quarter? ____ Arrival ____ Departure
   Would you have preferred ___ more, ___ less, ___ same amount of matches?
   Why? _____

7. Were your matches within ___ 5 blocks, ___ 10 blocks, ___ 15 blocks, ___ more than 2 miles from your home?
   Were your matches within a line of travel to the University? _____

PLEASE COMMENT OR MAKE SUGGESTIONS ABOUT THE CAR POOL SERVICE ON THE REVERSE SIDE.
IF YOU ARE CURRENTLY IN A CAR POOL FORMED THROUGH OUR SERVICE, PLEASE COMPLETE THE FOLLOWING.

8. How did you get to the University before you joined the Car Pool System? ___ bicycle ___ drove alone ___ rode the bus ___ rode the U Express Bus (Route __) _____ other

9. To what degree were you satisfied with your matches?
   ___ very satisfied ___ satisfied ___ dissatisfied ___ very dissatisfied
   Why? _____

10. How many people, including yourself, are participating in your car pool on a regular basis? (circle one) Arrival 2 3 4 5 6 More than 6 Departure 2 3 4 5 6 More than 6

11. Do you ___ ride, ___ drive, ___ share driving?

12. Where does your car pool park? ___ University Lot #35 (Car Pool Lot)
    ___ Another University Lot (identify street or building location) _____
    ___ Free Como Lot (bus to both campuses) ___ private lot ___ other _____

13. How are car pool costs shared? ___ The riders pay for both gas and parking. ___ The driver pays for both gas and parking. ___ The riders pay for parking, the driver for gas. ___ The driver pays for parking, the riders pay for gas. ___ The riders each pay a set fee. ___ The driver for the day pays all expenses, and the members of the car pool take turns driving.

14. Does your car pool alternate drivers? ___ yes ___ no

15. Do you ride with the same people in the afternoon as in the morning? ___ yes ___ no

16. By carpooling your travel time was increased/decreased/not affected (circle one) by ___5, ___10, ___15, ___20, ___25 minutes.

17. Would you utilize a centrally located car pool list to provide new or additional matches midway through the Quarter? ___ yes ___ no

18. How have you benefited by carpooling considering economics, energy conservation, the environment, and your enjoyment? (Please use reverse side for comments.)

APPLICATION DEADLINE FOR WINTER QUARTER IS DECEMBER 12th. Apply next quarter and.....

"have a pool party--a carpool party!"

STATISTICAL BREAKDOWN FOR PERSONS RECEIVING CAR POOL MATCHES

Question 1	No Car Pool	%	Formed Car Pool	%	Total	%
a. Designation						
Undergraduate	21	50%	20	58.8%	41	53.9%
Graduate	1	2.4%	5	14.7%	6	7.9%
Faculty	4	9.5%	2	5.9%	6	7.9%
Staff	15	35.7%	7	20.6%	22	28.9%
Other	---	---	---	---	---	---
More than 1	1	2.4%	---	---	1	1.3%
b. Male	16	38.1%	12	35.3%	28	36.8%
Female	17	40.5%	17	50.0%	34	44.7%
No answer	9	21.4%	5	14.7%	14	18.4%
c. Age						
18 - 20	10	23.8%	4	14.7%	15	19.7%
21 - 22	2	4.8%	6	17.6%	8	10.5%
23 - 24	3	7.1%	5	14.7%	8	10.5%
25+	10	23.8%	8	23.5%	18	23.7%
No. answer	17	40.5%	10	29.4%	27	35.5%
Question 2						
a. Miles from University						
1 - 5	10	23.8%	6	17.6%	16	21.1%
6 - 10	21	50.0%	11	32.4%	32	42.0%
11 - 15	9	21.4%	10	29.4%	19	25.0%
16 - 20	1	2.4%	5	14.7%	6	7.9%
21 - 25	---	---	1	2.9%	1	1.3%
No answer	1	2.4%	1	2.9%	2	2.6%
b. Direction						
north	---	---	2	5.9%	2	2.6%
northwest	4	9.5%	5	14.7%	9	11.8%
northeast	6	14.3%	7	20.6%	13	17.1%
east	3	7.1%	1	2.9%	4	5.3%
south	6	14.3%	5	14.7%	11	14.5%
southeast	4	9.5%	2	5.9%	6	7.9%
southwest	7	16.7%	4	11.8%	11	14.5%
west	8	19.0%	4	11.8%	12	15.8%
No answer	4	9.5%	4	11.8%	8	10.5%
3. Currently in a car pool through system?						
yes	---	---	30	88.2%	30	39.5%
no	41	97.6%	---	---	41	53.9%
No answer	1	2.4%	4	11.8%	5	6.6%

4. Did you apply fall quarter?

yes	14	=	33.3%	9	=	26.5%	23	= 30.3%
no	21	=	50.0%	16	=	47.0%	37	= 48.7%
no answer	7	=	16.7%	9	=	26.5%	16	= 21.0%
If yes, did you form a pool through system?								
yes	5	=	11.9%	10	=	29.4%	15	= 19.7%
no	33	=	78.6%	17	=	50.0%	50	= 65.8%
no answer	4	=	9.5%	7	=	20.6%	11	= 14.5%

b. Did you apply winter quarter?

yes	12	=	28.6%	8	=	23.5%	20	= 26.3%
no	19	=	45.2%	15	=	44.0%	34	= 44.7%
no answer	11	=	26.2%	11	=	32.4%	22	= 28.9%
If yes, did you form a pool through the system?								
yes	2	=	4.8%	5	=	14.7%	7	= 9.2%
no	27	=	64.3%	17	=	50.0%	44	= 57.9%
no answer	13	=	30.9%	12	=	35.3%	25	= 32.9%

c. Did you apply spring quarter?

yes	12	=	28.6%	9	=	26.5%	21	= 27.6%
no	19	=	45.2%	17	=	50.0%	36	= 47.4%
no answer	11	=	26.2%	8	=	23.5%	19	= 25.0%
If yes, did you form a pool through the system?								
yes	1	=	2.4%	3	=	8.8%	4	= 5.3%
no	30	=	71.4%	19	=	55.9%	49	= 64.5%
no answer	11	=	26.2%	12	=	35.3%	23	= 30.3%

5. Satisfied; will reapply	2	=	1.8%	17	=	50.0%	19	= 25.0%
Satisfied; no need to reapply	--------			5	=	14.7%	5	= 6.6%
Satisfied: stay in same pool	1	=	2.4%	5	=	14.7%	6	= 7.9%
Not satisfied; will reapply	25	=	59.5%	4	=	11.8%	29	= 38.2%
Not satisfied; will not reapply	11	=	26.2%	---------			11	= 14.5%
no answer	3	=	7.1%	---------			3	= 3.9%
more than 1	---------			3	=	8.8%	3	= 3.9%

6. a. Matches - Arrival								
0	1	=	2.4%	---------			1	= 1.3%
1	23	=	54.8%	18	=	52.9%	41	= 53.9%
2	10	=	23.8%	7	=	20.6%	17	= 22.4%
3	4	=	9.5%	5	=	14.7%	9	= 11.8%
5	---------			1	=	2.9%	1	= 1.3%
6	1	=	2.4%	---------			1	= 1.3%
no answer	3	=	7.1%	3	=	8.8%	6	= 7.9%

b. Matches - Departures

0	2 = 4.8%	4 = 11.8%	6 = 7.9%
1	20 = 47.6%	16 = 47.0%	36 = 47.4%
2	8 = 19.0%	5 = 14.7%	13 = 17.1%
3	3 = 7.1%	4 = 11.8%	7 = 9.2%
4			
5			
6	1 = 2.4%	1 = 2.9%	2 = 2.6%
no answer	8 = 19.0%	4 = 11.8%	12 = 15.8%

c. Number of matches preferred

more	39 = 92.9%	24 = 70.6%	53 = 82.9%
less			
same	2 = 4.8%	9 = 26.5%	11 = 14.5%
no answer	1 = 2.4%	1 = 2.9%	2 = 2.6%

7. a. Matches - distance from home

5 blocks	5 = 11.9%	17 = 50.0%	22 = 28.9%
10 blocks	13 = 30.9%	7 = 20.6%	20 = 26.3%
15 blocks	8 = 19.0%	6 = 17.6%	14 = 18.4%
2 miles +	9 = 21.4%	3 = 8.8%	12 = 15.8%
no answer	7 = 16.7%	1 = 2.9%	8 = 10.5%

Remaining questions pertain only to those in a car pool

8. Transportation used before car pool

Bicycle	
Drove alone	14 = 41.2%
Rode bus	7 = 20.6%
U Express bus	1 = 2.9%
Other	6 = 17.6%
No answer	1 = 2.9%
More than 1	5 = 14.7%

9. Extent satisfied

Very satisfied	12 = 35.3%
Satisfied	14 = 41.2%
Dissatisfied	7 = 20.6%
Very dissatisfied	1 = 2.9%
No answer	

10. Persons in pool

a. Arrival

2	19 = 55.9%
3	7 = 20.6%
4	4 = 11.8%
5	1 = 2.9%
no answer	3 = 8.8%

b. Departure

2	17 = 50.0%
3	10 = 29.4%

4	1	=	2.9%
5	1	=	2.9%
no answer	5	=	14.7%

11. Do you

Ride	9	=	26.5%
Drive	14	=	41.2%
Share driving	11	=	32.4%

12. Where pool parks

Car Pool Lot	3	=	8.8%
Another U Lot	20	=	58.8%
Como Lot	1	=	2.9%
Private Lot			
Other	5	=	14.7%
More than 1	1	=	2.9%
No answer	4	=	11.8%

13. Car Pool Costs

Riders pay gas and parking	1	=	2.9%
Driver pays gas and parking	4	=	11.8%
Riders pay parking; driver pays gas	5	=	14.7%
Driver pays parking, riders pay gas			
Riders pay set fee	13	=	38.2%
Driver pays all expenses and shares driving	6	=	17.6%
More than 1	4	=	11.8%
Other	1	=	2.9%

14. Pool alternates driver

yes	14	=	41.2%
no	20	=	58.8%

15. Ride with same people morning and evening

yes	27	=	79.4%
no	6	=	17.6%
not applicable	1	=	2.9%

16. Travel Time	Increase			Decrease		
5 min	4	=	11.8%	1	=	2.9%
10	6	=	17.5%	2	=	5.9%
15	2	=	5.9%	1	=	2.9%

20 minutes	----------	1 =	2.9%
25	----------	2 =	5.9%
More than 35	----------	2 =	5.9%
Not affected	10 = 29.4%		
No answer	3 = 8.8%		

17. Use of centralized pool

yes	26 =	76.5%
no	7 =	20.6%
no answer	1 =	2.9%

Of those matched, the following reasons were given for desiring more matches:

3 indicated they needed more than 1 rider to park in Car Pool Lot
7 indicated that they needed matches that were closer
11 indicated they could have more riding
6 indicated they needed a driver
13 indicated a desire for greater flexibility in terms of scheduling (days and/or times)
4 indicated that more matches would make pooling more economical
2 mentioned they would like others to share in driving

Of those who formed pools through their matches, the following comments were made:

a. Those satisfied with their matches were satisfied because:

5 indicated their schedules among their poolers worked out well
8 indicated they enjoyed the company and/or their poolers were compatible
2 indicated proximity of poolers to their (driver's) residence
4 indicated pooling was economical time wise
7 indicated pooling was economical - defraying expenses

b. Those not satisfied were dissatisfied because:

3 indicated their poolers were out of the way
1 indicated the schedules were "off"

Other general comments included:

1 driver looked up potential riders. Riders had previously been sent "no one in their area" by the computer
4 indicated they could take more people within their line of travel to the U
1 felt filling out an application card should be mandatory but not making participation mandatory
2 indicated pooling was "cheaper" than the bus
1 indicated pooling was less time consuming than the bus
2 wanted a centralized list
5 indicated benefits of conservation and less pollution by pooling
1 rider previously rode express bus

Those who recieved matches but did not form a pool as well as those receiving no matches had the following comments or suggestions:

a. Comments

1 wouldn't consider car pooling with availabiltiy of the MTC express buses
1 could not use Lot #35 if only 2 in car
7 poor scheduling/times
1 distances did not work out
1 received names too late
11 no provision for persons working on University Ave.
1 said questionaire difficult to understand

b. Suggestions

1 would like separate opportunities for both coming and going
1 give names of persons leaving earlier or later than applicant asked for
1 would like list of people living within 2 miles of house regardless of schedules
1 said include at least 1 driver even if you have to enlarge usual area
1 said use a larger geographical area
1 would like centrally located list
1 should include greater area for line of travel
1 student car poolers don't work out well with staff due to their hours
1 might be useful to compute additional matches during winter quarter
1 when get people from areas farther out, should give names from a larger area

PERSONALIZED COMPUTER CAR POOL SYSTEM

THIRD QUARTERLY REPORT

TECHNICAL DEVELOPMENTS

Hybrid Computer Laboratory
University of Minnesota
December 1973

UNIVERSITY OF Minnesota

HYBRID COMPUTER LABORATORY
SPACE SCIENCE CENTER • MINNEAPOLIS, MINNESOTA 55455

December 10, 1973

3rd Quarterly Report: Computerized Car Pooling

Program Performance Analysis and Examination of Fall Quarter Computer Run

Phase I of the Computerized Car Pooling program was run with approximately 1700 applicants. Despite the extensive planning and preparation of a reasonably simple input data format, about 200 applicants supplied information which proved inadequate or otherwise insufficient as input to the "ADMATCH" program. Following this initial rejection of unusable data, the program ran smoothly and according to expectation with respect to overall matching efficiency. Unfortunately, the population sample size of 1500 is not large enough to adequately test, in a quantitative sense, the robustness of the basic Phase I matching algorithm. For example, because there were only twice as many applicants as Traffic Analysis Zones (1500-750), the potential for even a "crude" match of applicants with exactly the same arrival and departure time schedules is limited. A randomized evaluation study of matching efficiency done by the Hybrid Computer Laboratory showed that efficiency for this type of refined matching algorithm becomes high only when the population size exceeds 5000. In any case, because of the small (1500) matching population, an applicant can easily cause an unmatched condition for himself by not using the standard arrival and departure time for either time slice (MWF or TTH). It would appear that for small populations, a matching algorithm based on zip

codes or some type of geographic overlay would provide better results with respect to the applicants' expectations (i.e., in our case, just a list of people who live "near by" and go to the University). Another argument in favor of a simpler matching base for small populations is the fact that people prefer some information as opposed to none at all, as is the case for rejected applicants in a more refined matching program. A statistical summary is given on the following pages.

Phase II of the matching algorithm has been implemented for the Winter Quarter Run. With respect to the adverse pooling conditions associated with a small population, an attempt will be made to match, on a less refined basis, applicants not matched after passing through the Phase II algorithm. This will be done without altering the basic structure of the present program.

Several other surface changes have been made in an attempt to improve overall matching performance. The "DRIVE ONLY" category has been eliminated from the application cards. This will prevent the inherent rejection tendencies caused by DRIVER-DRIVER, DRIVER-SHARED, and SHARED-PASSENGER district pairings, and will clearly improve the performance of the program in satisfying the needs of smaller populations. Also, applicants with rural post office addresses will be input separately to avoid rejection in the "ADMATCH" program. With the above changes and the incorporation of the Phase II algorithm, matching efficiency for the Winter Quarter run is expected to improve despite the relatively small population size.

Composition of Applicants
Fall Quarter, 1973

Total number of applicants	1766
Number of applicants with inadequate data for processing	201
Total number of applicants with adequate data for processing	1565
Number of applicants MATCHED	834
Number of applicants NOT matched	731
Number of undergraduate students	983
Number of graduate students	169
Number of civil servants	297
Number of faculty	73
Number of adult specials	43

Arrival-Departure Time Profile
Fall Quarter, 1973

HALF-HOUR INTERVAL	ARRIVAL-MWF	DEPARTURE-MWF	ARRIVAL-TTH	DEPARTURE-TTH
630- 700	14	7	11	4
700- 730	60	11	60	8
730- 800	283	2	279	4
800- 830	583	4	563	3
830- 900	62	4	64	1
900- 930	330	11	272	7
930-1000	29	3	45	1
1000-1030	124	16	125	23
1030-1100	11	5	8	3
1100-1130	58	48	59	53
1130-1200	6	11	3	11
1200-1230	35	132	32	122
1230- 100	0	0	0	0
100- 130	23	97	21	83
130- 200	1	16	2	18
200- 230	6	176	18	127
230- 300	2	46	0	33
300- 330	6	163	4	133
330- 400	0	48	0	58
400- 430	8	153	1	146
430- 500	1	294	2	293
500- 530	1	162	2	210
530- 600	1	50	2	47
600- 630	7	57	5	53
TOTALS	1651	1536	1578	1444